The Informativeness of Recycled Items: Evidence from Pension Accounting

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Abstract

Employers sponsoring defined benefit pension plans recognize remeasurement gains/losses (GL) and adjustments to prior service costs (PSC) in other comprehensive income (OCI), close them to accumulated other comprehensive income (AOCI), and subsequently reclassify them to earnings (RECLASS). Researchers and standard setters question the appropriateness of this practice since reclassification adjustments affect earnings several periods after the economic event that gave rise to them. We use hand-collected data to assess the usefulness of pension-related $OCI^{GL\ and\ PSC}$, $AOCI^{GL\ and\ PSC}$, and $RECLASS^{GL\ and\ PSC}$ in predicting year-ahead pension expense and cash contributions to the pension fund. We find that $RECLASS^{GL}$, OCI^{GL}, and $AOCI^{GL}$ are useful predictors of year-ahead pension expense and cash contributions. Interestingly, we find that $RECLASS^{GL}$ and OCI^{GL} amounts exhibits incremental explanatory power for firms' market value of equity, but $AOCI^{GL}$ does not. We find very weak evidence of predictive ability and relevance for $RECLASS^{PSC}$, OCI^{PSC}, and $AOCI^{PSC}$, a finding likely attributable to the small size and rarity of these adjustments in our sample. To the extent that a persistent, incrementally predictive and value relevant item is decision useful and decision-usefulness is a desired quality of accounting information, our results support continuing the practice of reclassifying remeasurement gains/losses. In contrast, it appears that the practice of reclassifying PSC adjustments likely provides little information. Our study contributes to the debate among researchers and standard setters regarding the appropriateness of reclassifying items from AOCI to earnings.

Keywords: other comprehensive income, reclassification adjustments, pension accounting, FASB Invitation to Comment

1. Introduction

This paper investigates the predictive usefulness and value relevance of defined benefit pension plan remeasurement gains/losses (GL) and adjustments to prior service costs (PSC) included other comprehensive income (OCI^{GL} and OCI^{PSC}, respectively), closed to accumulated other comprehensive income ($AOCI^{GL}$ and $AOCI^{PSC}$), and subsequently recognized in net income ($RECLASS^{GL}$ and $RECLASS^{PSC}$). The transfer of amounts from AOCI to earnings is referred to as a reclassification adjustment.[1] Reclassification of net gains (losses) and decreases (increases) to prior service costs decrease (increase) current year pension expense. Reclassification adjustments are an application of historical cost accounting that results in a smoother time series of earnings.

Questions about the decision-usefulness of pension-related reclassification adjustments arise because of the time lag between when an economic event occurs (e.g., actual and expected returns on pension assets differ) and when an amount related to the event is reclassified to the income statement. Critics argue that reclassification adjustments "make it difficult to understand the entity's performance for a reporting period because the amounts reported in earnings are not correlated to the economic performance of the current periods" [FASB 2016, Invitation To Comment (ITC): 20]. However, a recent survey of professional financial statement users suggests that they find the pension footnote, where pension expense is disaggregated into its various components (including reclassifications), useful in their analysis (Drake, Hales, and Rees 2017).

Rees and Shane (2012), Black (2016) and Bradbury (2016) review research assessing the predictive ability and value relevance of OCI and its components.[2] All three reviews characterize

[1] ASC 220-10-45-15 states "reclassification adjustments shall be made to avoid double counting of items in comprehensive income that are presented as part of net income for a period that also had been presented in other comprehensive income in that period or earlier period."

[2] The referenced articles do not review studies of the pricing of amounts recognized in OCI related to cash flow hedges (Bratten, Causholli, Khan 2016; Campbell 2015; Makar, Wang, and Alan 2013) or translation adjustments (Bratten et al. 2016; Setyaningrum and Siregar 2015; Makar et al. 2013; Louis 2003). These studies are not directly relevant to

research findings as inconclusive and call for additional research. Rees and Shane (2012: 58) assert the reclassification issue "represents the key to whether the current practice of OCI reporting can be justified. If recycling[3] does not provide better information to users, then we believe this complex accounting method should be scrapped in favor of the more straightforward practice of reporting comprehensive income in one performance statement with EPS based on comprehensive income." In order to assess whether reclassification of pension amounts provides useful information to users, we assess whether, after controlling for pension related AOCI balances and current period pension-related adjustments included in OCI, reclassification adjustments are useful in predicting year-ahead pension expense and cash contributions to the pension fund. We also examine potential pricing implications.

We are aware of only two studies (Dong, Ryan, and Zhang 2014; Badertscher, Burks, and Easton 2014) that examine the decision usefulness of reclassification adjustments. Both examine banks' reclassifications of unrealized gains/losses on available-for-sale securities (AFS). In Dong et al. (2014) the trigger for reclassification is a sale. In Badertscher et al. (2014) the trigger is the arrival of new information that leads management to conclude there is significant doubt that the firm can hold the security until the fair value recovers to amortized cost. These studies provide evidence the market values reclassification adjustments, a finding that is at odds with the expectation the market would value AFS-related unrealized gains/losses recognized in OCI but not necessarily the reclassification to NI when AFS securities are sold (Dong et al. 2014) or management determines securities are other-than-temporarily impaired (OTTI) (Badertscher et al.

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our work. They do, however, provide evidence suggesting the market may have difficulty interpreting amounts recognized in OCI. For example, Makar et al. (2013) interpret the results of their tests of the market pricing of net gains/losses on cash flow hedges as consistent with mixed attribute pricing theory (Gigler, Kanodia, and Venugopalan 2007) and with the mixed attribute accounting model providing inadequate information on the net economic effects of foreign exchanges cash flow hedges.

[3] The terms reclassify and recycle have been used interchangeably in the literature. Our use of reclassify is consistent with the FASB's current usage.

2014). Dong et al. (2014) suggests that reclassifications are likely priced because they help investors predict banks' future performance. Badertscher et al. (2014) find that OTTIs are priced more for banks with strong reported earnings performance, suggesting that investors question whether the strong reported performance accurately reflects the quality of the bank's assets.

In contrast to market-triggered AFS reclassifications,[4] the triggers for pension-related reclassifications are mechanical. Remeasurement gains/losses, which are recognized in OCI^{GL} and closed to $AOCI^{GL}$, arise from changes in the value of either the plan liability (projected benefit obligation) or plan assets resulting from experience different from that assumed or from a change in an actuarial assumption (ASC 715-50-1).[5] A *portion* of these gains/losses are reclassified from AOCI only if the total amount of gains/losses stored in AOCI exceeds a materiality threshold.[6] Once reclassification is triggered, firms must continue to reclassify a portion of the gains/losses until the amount stored in AOCI no longer exceeds the threshold. PSC adjustments are systematically reclassified over the average remaining service life of employees affected by the amendment. Thus, pension-related reclassifications ($RECLASS^{GL}$ and $RECLASS^{PSC}$) typically will affect multiple periods. In contrast, the reclassifications studied in Dong et al. (2014) only arise when a sale takes place, and each reclassification affects only one period (the period of the sale). Similarly, while the OTTIs studied in Badertscher et al. (2014) must be re-evaluated every reporting period, reclassification only takes place in subsequent periods if the market value falls even further below amortized cost (recovery of OTTIs are not allowed). Lastly, while Dong et al.

[4] The triggers for reclassification for the other two components of OCI are also market-related: settlement of the hedged transaction for cash flow hedges and the sale or liquidation of foreign investment for translation adjustments.
[5] ASC 715 does not define the expression actuarial gains and losses. It confines the use of that expression to the reconciliation of the beginning and ending balances of the benefit obligation (ASC 715-50-1).
[6] The materiality threshold is determined by applying the corridor method, which requires reclassification of net gains/losses, if as the beginning of the year, the net actuarial gain/loss exceeds 10% of the greater of the PBO or market-related value of plan assets. The amount in excess of the 10% threshold is amortized over the average remaining service lives of employees accruing benefits under the plan (ASC 715-30-35-24).

(2014) and Badertscher (2014) focus on banks' due to the prevalence of AFS securities held by these firms, our sample contains firms from 37 different industry groupings (2-digit SICs). Given these differences, the results of prior research cannot be generalized to pension-related reclassifications.

Due to the time required to hand-collect $RECLASS^{GL}$ and $RECLASS^{PSC}$ we focus on firms with economically significant pension plans. Specifically, we create a ratio of the pension liability scaled by total assets to identify the size of the pension plan relative to the size of the company. We restrict our initial sample to the 200 firms with the largest average ratio during our sample period. We hand collect $RECLASS^{GL}$ and $RECLASS^{PSC}$ for the years 2008-2015. Using $RECLASS^{GL}$ ($RECLASS^{PSC}$) and $AOCI^{GL}$ ($AOCI^{PSC}$), which is available via the COMPUSTAT pension database, we compute OCI^{GL} (OCI^{PSC}).

We find that $RECLASS^{GL}$, OCI^{GL}, and $AOCI^{GL}$ are all predictive of year-ahead pension expense and cash contributions to the pension fund. Exploring potential pricing implications, we find that $RECLASS^{GL}$ and OCI^{GL} exhibits incremental explanatory power for firms' market value of equity, but $AOCI^{GL}$ does not. We also utilize hand collected data regarding management estimates of $RECLASS^{GL}$ and find that the unexpected portion of $RECLASS^{GL}$ (the difference between management's stated expectations and actual amount) is useful in explaining short window market-adjusted returns, providing further evidence of the market pricing of $RECLASS^{GL}$. Turning to prior service costs, we find that $RECLASS^{PSC}$ has predictive ability for year-ahead pension expense, while OCI^{PSC} and $AOCI^{PSC}$ do not. We find no evidence of predictive ability of $RECLASS^{PSC}$, OCI^{PSC}, $AOCI^{PSC}$ in predicting year-ahead cash contributions. We also find no evidence that the market prices prior service cost amounts. The lack of predictive ability and relevance of prior service cost amounts are potentially attributable to the small size and rarity of

PSC adjustments in our sample. We discuss our progress in the exploration of the pricing of $AOCI^{GL}$.

We contribute to the literature by providing empirical evidence relevant to the debate among accounting scholars and standard setters regarding reclassification. We are the first paper to assess the usefulness of pension-related reclassification amounts, which have vastly different qualities relative to AFS-related reclassification amounts studied in prior literature. In addition, for firms that sponsor defined benefit pension plans the pension-related components of AOCI are several time larger than the AOCI balances for AFS securities examined in prior literature (Dong et al. 2014 and Badertscher 2014), highlighting the economic significance of these amounts.

We provide evidence that reclassification of remeasurement gains/losses, but not prior service cost adjustments, satisfy Marshall and Leonard's (2016) criterion of enhancing profit or loss because they predict future pension expense and cash contributions, and are also value relevant. However, because a given pension plan's obligations extend decades into the future, reclassifications of remeasurement gains/losses do not fulfill Marshall and Leonard's criterion of completing the depiction of an event that is recognized in the current period.

Our research provides insight concerning a recent exposure draft in which the FASB notes that, "Differences between earnings and comprehensive income of business enterprises exist because past standards have required or permitted several types of items to be excluded from net income and later reclassified into net income. Currently, there is no conceptual basis for determining which items qualify for that treatment" (FASB 2016: PR32).[7] To the extent that persistence, predictive ability and value relevance are indicators that amounts generated by application of an accounting method are decision useful, our results provide some support for

[7] The FASB's 'notion' that AOCI gains (losses) should be reclassified is consistent with clean surplus theory (Ohlson 1995, 1999) and the all-inclusive concept of income (Edwards and Bell 1961).

continuing to reclassify remeasurement gains/losses. In contrast, it appears that the practice of reclassifying PSC adjustments likely provides little information.

The rest of our paper is structured as follows. Section 2 describes pension-related reclassification adjustments. Section 3 discusses prior literature. Section 4 develops hypotheses. Section 5 explains the research design. Section 6 discusses the sample selection, descriptive statistics, and results. Section 7 concludes.

2. Background on Reclassifications

Background on the FASB and Reclassifications

The FASB does not identify the qualitative characteristics that distinguish items included in OCI from those included in earnings (FASB 1997). Instead, it provides a list of items currently included in OCI: foreign currency translation adjustments, net gains/losses on cash flow hedges, net unrealized gains/losses on available-for-sale-securities (AFS)[8], and gains/losses and prior service costs/credits[9] associated with pension and other post-retirement benefit plans. These items result from current period revaluations and deferred exchanges; preparers view them as beyond management's control and as inappropriately increasing volatility if included in net income (FASB 1997).

Figure 1 diagrams the relationship between the components of comprehensive income and stockholders' equity accounts. Pension-related re-measurement gains/losses and prior service cost adjustments, two of the current period revaluations and deferred exchanges included in OCI by the

[8] ASU No. 2016-01 (FASB 2016) supersedes guidance to classify equity securities with readily determinable fair values into trading and AFS categories. For fiscal years beginning after December 15, 2017, equity investments (except those accounted for using the equity method) are to be measured at fair value with changes in fair value recognized in net income.

[9] Prior service credits are much less frequent than prior service costs. As such, for purposes of brevity, we refer to prior service costs/credits as prior service costs, except when used in quotations.

FASB, will be reclassified through net income in future periods. Thus, net income (NI) results from the application of a mixed attributes model.

Insert Figure 1

In 1985, the FASB characterized its first major effort to improve pension measurement and disclosure as continuing "the evolutionary search for more meaningful and useful pension accounting" (FASB 1985: 6). The Board concluded that it "believes that it would be conceptually appropriate and preferable to recognize a net pension liability or asset measured as the difference between the projected benefit obligation and plan assets, either with no delay in recognition of gains and losses, or perhaps with gains and losses reported currently in comprehensive income but not in earnings." (FASB 1985: 26).

The FASB (1985: 9) did not require immediate recognition of gains/losses as components of pension expense because they "may reflect refinements in estimate as well as changes in economic values and because some gains in one period may be offset by losses in another period and vice versa." The Board agreed to defer and reclassify gains/losses according to a materiality threshold to allow "a reasonable opportunity for gains and losses to offset each other" without affecting net income (FASB 1985: 38).[10] The deferral of the income statement recognition of prior service costs arising from plan amendments is rationalized based on the argument that costs should be recognized in future periods when employees are more productive because of the amendment (FASB 1985: 9).

The Calculation and Meaning of Reclassification Adjustments

Pension gains/losses arise because of differences between estimated and actual experience and changes in plan assumptions. On the asset side, companies include the expected return on plan

[10] Board member Arthur Wyatt characterized the corridor method as "a practical mechanism to mitigate volatility" (FASB 1985:20).

assets as a reduction in computing pension expense. Differences between expected and actual returns and changes in the expected rate of return assumption are gains/losses recognized in OCI. On the liability side, companies estimate the plan's projected benefit obligation (PBO) as the actuarial present value of benefits due to employees during retirement. The PBO is affected by assumptions about inflation, future compensation levels, mortality, interest rates and employee turnover. Changes in these assumptions lead to fluctuations in the calculated PBO, resulting in gains/losses.

Although U.S. GAAP allows immediate recognition of gains/losses and prior service cost increases/decreases, most companies continue to defer and reclassify them.[11] The corridor method of U.S. GAAP requires reclassification from AOCI if as of the beginning of the year the net gain/loss exceeds 10 percent of the greater of the PBO or market-related value of plan assets. The amount in excess of the 10 percent threshold is reclassified over the average remaining service lives of employees who will receive benefits under the plan (ASC 715-30-35-24).

Prior service costs are recognized in OCI when a company retroactively amends a defined benefit plan. The amendment increases the amount of prior service costs that will be amortized in future periods. Proponents of current practice characterize the deferred cost of retroactive plan amends as an unrecognized asset that will be realized through higher future employee productivity (FASB 1985:34). Prior service costs accumulated in AOCI are amortized over the average remaining service lives of employees affected by the amendment. These reclassifications are a component of pension expense. In Figure 2, we diagram the impact of a mixed attributes model on

[11]Since the 2007-2009 financial crisis, forty-three companies have switched from deferred to immediate recognition (Burke, Chen and Eaton 2017), a small number compared to the population of U.S. single employer defined benefit plans (GOA 2009). Burke et al.'s comparison of matched switching and non-switching companies shows that the earnings of switching firms are less informative and there is an increased investment of plan assets in debt.

the calculation of pension expense, which aggregates three components: compensation (service cost), net financing cost (return on plan assets and interest expense), and reclassifications of prior period economic events from AOCI, and other items such as curtailments and settlements.

Insert Figure 2

Reclassifications under U.S. GAAP and IFRS

U.S. GAAP and IFRS guidance on reclassification diverges. We briefly discuss this divergence to illustrate a difference in perspective in the importance and meaning of reclassification adjustments. U.S. GAAP is based on the 'notion' that all items recognized in OCI and closed to AOCI should be reclassified to income. In contrast, IFRS prohibits reclassification of several items.

IAS 19R (2013) allows remeasurement gains/losses to be recognized in OCI when they arise and subsequently closed to an owners' equity account. Future gains/losses are netted with the gains/losses already in owners' equity. The balance in the account never is reclassified to earnings. This treatment is consistent with research that argues transitory gains/losses are limited in their usefulness for predicting future cash flows and firm value, and therefore should not necessarily be included in earnings (Jones and Smith 2011; Linsmeier et al. 1997, Barker 2004; Chambers, Linsmeier, Shakespeare, and Sougiannis 2007, Yen, Hirst, and Hopkins 2007; Bamber, Jiang, Petroni, and Wang 2010).

U.S. GAAP and IFRS also differ in their treatment of prior service costs. IAS 19R requires immediate recognition in the period the amendment occurs. It treats the cost of amendments as period expenses for which the amount and timing of future benefit is uncertain. With immediate recognition, there is no need for reclassification.

3. Review of relevant literature

Pricing of CI and unrealized gains/losses

The stated goal of most studies testing the predictive ability and value relevance of comprehensive income (CI) and the components of OCI is to provide evidence useful to accounting standard-setters (Rees and Shane 2012). Accordingly, the evolution of this body of literature is closely aligned with proposed and actual changes in accounting standards. The first studies are based on estimates of CI, (e.g., Dhaliwal, Subramanyan, and Trezevant 1999) and conducted while the FASB was debating how CI and the components of OCI should be disclosed. The second wave of research uses amounts of CI and its components reported after the issuance of SFAS 130 (FASB 1997) when OCI could be reported either as a separate performance statement or as an element of stockholders' equity (e.g., Bamber et al. 2010). Rees and Shane (2012), Black (2016) and Bradbury (2016) provide extensive reviews of this literature and call for further research, including study of reclassifications adjustments.

Pricing of Reclassification Adjustments

To determine whether AFS reclassification adjustments are incrementally value relevant, Dong et al. (2014) test a model in which AFS reclassifications and AFS gains/losses recognized in OCI are valued separately. Their model decomposes: (1) book value into AFS-related cost, AFS-related gains/losses included in AOCI, and non-AFS-related book values, (2) net income into AFS-related amounts reclassified from AOCI and the remaining items of income, and (3) OCI into AFS-related gains/losses and other OCI. They find significant differences in the coefficients of reclassified gains/losses and AFS gains/losses recognized in OCI, with the coefficient on reclassified gains/losses being close in size to the coefficients on other relatively permanent components of net income. Dong et al. (2014) interpret their results as indicating that reclassified gains/losses are incrementally value relevant. Based on further testing, they conclude that

reclassification gains/losses are valued because they help investors predict future bank performance.

Dong et al. (2014) refer to the realization of a gain/loss triggered by sales of AFS securities as an "economic realization" and distinguish it from "a realization for accounting purposes only" (p. 258), the type of realization Badertscher et al. (2014) examine in their study of the returns-relevance of amounts reclassified when AFS securities are determined to be OTTI.

Badertscher et al. (2014) argue that OTTI provides information about the recoverability of unrealized losses. Under current U.S. GAAP, unrealized AFS securities losses are recognized in OCI and closed to AOCI. The AOCI loss is reclassified when the underlying securities are sold or management concludes there is significant doubt the securities can be held until their fair value recovers to amortized cost (i.e., securities are OTTI). Opponents of reclassification assert that the market reacts to unrealized losses and uses information about those losses to predict OTTI. Accordingly, they expect investors to be able to predict OTTI and not to react significantly to the reclassification of gains/losses previously recognized in OCI. Badertscher et al.'s (2014) results do not support this conjecture. They find an incremental negative reaction to recognition of OTTI charges and conclude that such charges explain abnormal stock returns incrementally to unrealized gains/losses. They interpret their results as indicating OTTI charges provide investors with information about the fundamental value of securities and/or insights into the probability of regulatory intervention.

Pricing of the Components of Pension Expense

Barth, Beaver, and Landsman (1992) provides the earliest evidence of the value relevance of the disaggregated components of pension expense. They find that during the period 1986 to 1988 the components of pension expense generally were valued differently from one another based

on the permanency of their impact on earnings. During that period, U.S. GAAP required disclosure of four components: service cost, interest cost, actual return on plan assets, and 'other', an aggregate of amounts of amortization related to past transactions. Because of increased U.S. GAAP disclosure requirements, we are able to hand-collect the individual components of pension expense.[12]

Pricing of Gains/Losses and Prior Service Cost Components of OCI

Jones and Smith (2011) compare OCI (the sum of unrealized gains and losses related to available for sale securities, foreign currency translation, pensions, and cash flow hedges) and special items (SIs) using a model that jointly estimates value relevance, predictive value and persistence. Their objective is to determine whether the market treats SI and OCI differently because SI is recognized on the income statement in the period incurred and OCI is stored in AOCI until reclassified. Jones and Smith's results show that both SI and OCI are value relevant and have predictive value for year-ahead earnings and cash flows, with SIs having stronger predictive value.

4. Hypothesis Development

While the "primary source of information about an entity's performance for the period" is contained in the statement of profit and loss (IASB 2015), neither the IASB or FASB Conceptual Frameworks provide cohesive guidance to differentiate components of earnings from components of OCI (Rees and Shane 2012; Linsmeier 2016) or to determine why or when items should be reclassified from AOCI into earnings.

In the absence of characteristics to distinguish items to be recognized in OCI rather than earnings, Linsmeier (2016) proposes a statement of operating income followed by a statement of

[12]At the time of Barth et al.'s (1992) study the 'other' component consisted almost exclusively of amounts related to amortization of the net transition obligation/asset.

comprehensive income, which begins with operating income and is followed by a non-operating section that includes the results of remeasurements and delayed exchanges. He argues that because non-operating items generally never become operating items, the need for reclassification would be eliminated.

On the other hand, Nishikawa et al. (2016) support an all-inclusive performance statement where accumulated earnings and accumulated comprehensive income are equal over the lifetime of the firm. Such an approach is consistent with Ohlson's (1995) theory of clean surplus and implies that reclassified amounts will be useful to stakeholders. Similarly, the IASB's Exposure Draft (IASB 2015) proposes that items originally recorded in OCI should subsequently be reclassified to earnings unless there is a compelling reason not to do so.

Finally, Marshall and Lennard (2016) suggest something in between these two contrasting viewpoints. They argue that, "items originally reported in other comprehensive income should only be recycled to profit or loss when doing so enhances the relevance of profit or loss because it represents an event of the period, or completes the depiction of an event that is recognized in the period." The Alternate View in the IASB's Exposure Draft (IASB 2015) also supports this hybrid approach by noting that reclassifying certain items would not meet the definition of income or expenses, distort earnings, and be confusing to investors.

The goal of our research is to provide evidence whether a mixed attributes model which reclassifies pension gains/losses and prior service costs enhances the relevance of profit or loss. There are three reasons why we pursue this goal. First, regulators, practitioners, and accounting scholars continue to debate what would constitute an appropriate performance statement, even at a basic conceptual level (Rees and Shane 2012). In addition, the current and debated treatment of

reclassification adjustments impacts the most widely used performance metric derived from financial reporting: EPS (Linsmeier 2016).

Second, while prior research has examined other reclassified items (Badertcher et al. 2014; Dong et al. 2014), reclassified pension items have distinct characteristics. Marshall and Lennard (2016) suggest that no item should be included in earnings if it would impede the achievement of the performance statement's objective. Whether the reclassification of gains/losses from a sale of AFS (or an OTTI of AFS) achieves the objective of the performance statement is not indicative of whether the reclassification of pension gains/losses achieves the same objective. Reclassified gains/losses from the sale of AFS occur upon an economic realization from the sale of the securities that is calculated by easily determinable market prices. OTTI reclassified amounts are triggered by management's assessment that significant doubt exists that the firm can hold the security until fair value recovers to amortized cost. In contrast, pension-related reclassifications are formulaic allocations of measurements of economic events that occurred in earlier periods.

Third, defined benefit (DB) pension plans continue to be an important component of employee compensation and the related financial statement balances are substantial. Among the S&P 500 Index, 299 companies maintain DB plans with aggregate pension assets of $1.4 trillion (Wilshire 2015). A recent study by pension consulting firm Towers Watson concludes, "It's noteworthy that DB plans still serve certain industries and companies well, especially those with particular talent and retention needs" (Towers Watson 2014). Descriptive statistics in Table 1 provide evidence that, on average, $RECLASS^{GL}$ is almost as large as pension expense itself. Thus the income statements of firms sponsoring DB plans are impacted by the current accounting standards and any potential future changes. The case against reclassifying pension-related amounts

is stronger if empirical results show these reclassified amounts do not have predictive value and are not value relevant.

Our first research objective is to determine whether pension-related reclassifications have predictive value. The FASB's conceptual framework discusses the importance of financial information that has predictive value. Proponents of the corridor approach to reclassification of gains/losses assert that gains/losses are transitory, and would offset each other over time and seldom would require reclassification (FASB 1985:10). Contrary to this expectation, evidence presented later in this paper shows that reclassified gains/losses ($RECLASS^{GL}$) are a large, persistent component of pension expense. Because reclassified gains/losses appear to be a permanent component of earnings, they may have predictive ability. We test the following directional hypothesis in the alternative.

H1*: $RECLASS^{GL}$ and $RECLASS^{PSC}$ predict future pension expense.*

Next, we examine future cash contributions to the pension plan. In the United States, companies are required to prepare two sets of pension accounting information: one set prepared according to U.S. GAAP and filed with the U.S. Securities and Exchange Commission (SEC); and the other prepared according to ERISA funding rules, and filed with the Department of Labor, the Pension Benefit Guaranty Corporation and the Internal Revenue Service. Although the rules governing pension plan accounting and funding are distinct and separate, there are similarities between the two that could make persistent components of pension expense useful for predicting cash contributions.

ERISA bases minimum pension contributions on the liabilities accrued during the year and the "funding shortfall" (excess of plan liabilities over plan assets), which is amortized over

seven years. This is similar to the process of reclassifying gains and losses under U.S. GAAP.[13] Thus, reclassification adjustments may be useful in predicting an employer's cash contribution to its pension plan. This is especially important given that ERISA information is not available to the public until seven months after the plan year ends.

Analysts predict employers' cash contributions as inputs to cash flow valuation models and for assessing cash flow requirements and credit status (Ballester, Fried, and Livnat 1998). The summary of SFAS 158 (FASB 2006) states "This Statement improves financial reporting because… it will be easier for users of those financial statements to assess an employer's financial position and ability to satisfy postretirement benefit obligation." Hence market participants may view gain/loss reclassifications as an indicator that more (less) firm resources will be needed to fund the pension plan. Reclassifications of prior service costs may be viewed as a permanent component of earnings with predictive ability. We test the following directional hypothesis, stated in the alternative.

***H2**: $RECLASS^{GL}$ and $RECLASS^{PSC}$ predict future cash contributions to pension plans.*

At least three arguments exist as to why reclassified gains/losses may be priced. First, as tables presented later show, reclassified gains/losses ($RECLASS^{GL)}$ are a persistent component of earnings. Ohlson (1999) discusses persistence as contributing to value relevance.[14]

Second, investors pay significant attention to earnings (Linsmeier 2016). Earnings as a performance measure is deeply ingrained in the economy (IASB 2013). Burke, Chen and Eaton (2016: 43) provide evidence suggesting management's desire to "avoid any dragging effect on

[13] However, there also are differences. First, different assumptions are used. Second, under funding rules the entire "funding shortfall" is amortized, but under U.S. GAAP we only amortize gains/losses that exceed 10% threshold. Second, in pension funding the amortization period is 7 years, while for pension accounting it is the average remaining service life of employee.

[14] We test for persistence and the predictive usefulness of reclassification adjustments before testing for value relevance.

future earnings" explains why firms with large, negative $AOCI^{GL}$ balances switched from deferred to immediate recognition of pension gains/losses. Switching allowed firms to transfer the $AOCI^{GL}$ balance to retained earnings, and thereby eliminate the need for future reclassification adjustments. Burke et al.'s arguments and test results suggest that management believes the market prices reclassification adjustments.[15] Because the switch did not affect future cash flows or provide previously undisclosed information, Burke et al.'s documentation of a positive market response to standalone announcements of switching raises questions about whether the market processes pension information efficiently. Picconi (2006) interprets his results as suggesting the market inefficiently processes complex pension disclosures.

Third, because $RECLASS^{GL}$ quantifies differences between expectations and outcomes, the magnitude of the cumulative gains/losses as well as the reclassified amount may provide information about the forecasting ability and skill of management and its actuarial and investment advisors.

As for reclassification of prior service costs ($RECLASS^{PSC}$), the deferred cost of retroactive plan amendments has been described as an asset that will be realized through higher future employee productivity (FASB 1985: 34), in which case it could be helpful information to investors. Alternatively, they could be valued because of investors' fixation on amounts affecting earnings.

On the other hand, there are four reasons why $RECLASS^{GL}$ and $RECLASS^{PSC}$ may not be priced. First, formulaic allocations of previously recognized amounts may have little to do with economic fundamentals. For example, if the market prices gains/losses and increases/decreases in

[15] Burke et al.'s results are based on comparisons of 38 switching firms and different control groups. $AOCI^{GL}$ equaled 12% of total assets for these firms. Twenty-seven of the firms switched to immediate recognition of gains/losses, eleven switched to immediate recognition of the gain/loss outside the 10% corridor with continued recognition in OCI of amounts within the corridor.

prior service costs when they originally are recognized in OCI, $RECLASS^{GL}$ and $RECLASS^{PSC}$ may be viewed as stale measures with no incremental value.

Second, $RECLASS^{GL}$ and $RECLASS^{PSC}$ are not direct measures of performance from events that occurred solely in the period they impact earnings. Therefore, their relation to the firm's current period performance is uncertain and perhaps ambiguous. It is not uncommon for a firm to recognize a gain in OCI in the same period it is reclassifying a loss to earnings.

Third, pension gains/losses result from 1) differences between management's estimates of returns on plan assets and actual returns on plan assets and changes in actuarial assumptions, and 2) changes in the PBO due to experience different from expectations and changes in actuarial assumptions, e.g. discount rates, retirement rates, mortality rates, employee turnover. As such, market participants may disregard reclassified gains/losses because they could result from opportunistically manipulated estimates (Anantharaman 2017).

Fourth, the IASB Financial Reporting Council (FRC 2014) asserts the objective of the statement of profit and loss is, "to present income and expenses for the period in order to report the returns of the period, and facilitate and assessment of accountability and future returns." $RECLASS^{GL}$ and $RECLASS^{PSC}$ may not meet this objective. For example, a current period reclassified loss does not necessarily mean losses will be reclassified in future periods. A major upturn (downturn) in the market that increases (decreases) plan assets and results in a large gain/loss could reduce the cumulative loss/gain in AOCI below the threshold that triggers reclassification.

Given the economic meaning of these reclassified items is unclear, it is an empirical question whether they impact prices. We test the following hypothesis in the null.

H3*: RECLASS^{GL} and RECLASS^{PSC} are not value relevant.*

5. Research Design

To examine our hypotheses, we disaggregate pension-related amounts as described in Appendix A. The FASB's Accounting Standards Update No 2017-07 (FASB 2017) requires the service cost component of net periodic pension cost be reported "in the same line item or items as other compensation costs arising from services rendered by the pertinent employees during the period." The remaining components are to be reported below the subtotal of income from operations (715-20-45-3A). Further, FASB (2017) permits reporting the interest cost and expected return on plan assets separately or together as net financing cost (715-20-55-13), see Figure 2. Thus, in our empirical tests we report service cost as COMP (compensation cost) and combine interest cost and expected return on plan assets as FIN (net financing cost).

In order to test H1, we estimate equation (1), which examines the predictive ability of pension-related book value and comprehensive amounts in predicting year-ahead pension expense. In our estimation of equation (1) we only include pension-related book value and comprehensive income amounts since our dependent variable is a pension specific measure. All variables, which are defined in Appendix B, are winsorized at the 1% level. Year-fixed effects are included and standard errors are clustered by firm.

$$PEXP_{t+1} = \alpha + \beta_1 AOCI^{GL}_t + \beta_2 AOCI^{PSC}_t + \beta_3 COMP_t + \beta_4 FIN_t + \beta_5 RECLASS^{GL}_t + \beta_6 RECLASS^{PSC}_t + \beta_7 Other_t + \beta_8 OCI^{GL}_t + \beta_9 OCI^{PSC}_t + \varepsilon_t \quad (1)$$

H1 is supported if $RECLASS^{GL}$ and $RECLASS^{PSC}$ are predictive of future pension expense (PEXP), $\beta_5 > 0$ and $\beta_6 > 0$). As with Model 1, we also evaluate $AOCI^{GL}_t$, $AOCI^{PSC}_t$, OCI^{GL}_t, and OCI^{PSC}_t as they could also have predictive power for $PEXP_{t+1}$.

To examine H2, we estimate equation (2), which examines the predictive ability of pension-related book value and comprehensive income amounts in predicting year-ahead cash

contributions to the pension fund. We also include lagged actual contributions as a control. All variables, which are defined in Appendix B, are winsorized at the 1% level. Year-fixed effects are included and standard errors are clustered by firm.

$$CC_{t+1} = \alpha + \beta_1 CC_t + \beta_2 AOCI^{GL}_t + \beta_3 AOCI^{PSC}_t + \beta_4 COMP_t + \beta_5 FIN_t + \beta_6 RECLASS^{GL}_t + \beta_7 RECLASS^{PSC}_t + \beta_8 OTHER_t + \beta_9 OCI^{GL}_t + \beta_{10} OCI^{PSC}_t + \varepsilon_t \quad (2)$$

To be consistent with the interpretation of the sign of the coefficients, the dependent variable (cash contributions to pension plans) is multiplied by negative one. Thus, H2 is supported if $RECLASS^{GL}$ and $RECLASS^{PSC}$ are predictive of future cash contributions to plan assets (CC), $\beta_6 > 0$ and $\beta_7 > 0$. As with Model 1, we also evaluate $AOCI^{GL}_t$, $AOCI^{PSC}_t$, OCI^{GL}_t, and OCI^{PSC}_t as they could also have predictive power for CC_{t+1}. For example, large losses/gains that continue to accumulate in AOCI indicate more (less) firm resources will be needed to fund the pension plan.

In order to test H3, we estimate equation (3), which examines the incremental explanatory power of book value and comprehensive income amounts in explaining market value of equity. In our estimation of equation (3) we only include both pension-related and non-pension related book value and comprehensive income amounts since our dependent variable based on overall firm value. All variables, which are defined in Appendix B, are winsorized at the 1% level. Year-fixed effects are included and standard errors are clustered by firm.

$$MV_t = \alpha + \beta_1 BVX^{OTHER}_t + \beta_2 AOCI^{GL}_t + \beta_3 AOCI^{PSC}_t + \beta_4 NIX_t + \beta_5 COMP_t + \beta_6 FIN_t + \beta_7 RECLASS^{GL}_t + \beta_8 RECLASS^{PSC}_t + \beta_9 OTHER_t + \beta_{10} OCI^{GL}_t + \beta_{11} OCI^{PSC}_t + \beta_{12} OCI^{OTHER}_t + \varepsilon_t \quad (3)$$

Rejection the null hypotheses of no value relevance, H3, would be demonstrated by a positive and significant association between $RECLASS^{GL}$ and $RECLASS^{PSC}$ and MV ($\beta_7 > 0$ and $\beta_8 > 0$). On the other hand, if reclassification of gains/losses and prior service costs through income is redundant and provides no additional information, as implied by the IASB's decisions, the

market would not value these items and β_7 and β_8 would be insignificantly different from zero. While our objective is to evaluate reclassification amounts, other pension-related amounts ($AOCI^{GL}_t$, $AOCI^{PSC}_t$, OCI^{GL}_t, and OCI^{PSC}_t) merit interpretation. For example, gains/losses (OCI^{GL}_t) could be informative to investors as they are representative of current period economic outcomes. Further, $AOCI^{GL}_t$ represents the cumulative gains/losses that are the source of future reclassifications to earnings and potentially predictive of future cash flows (cash contributions).

Next, we examine investors' response to reclassification amounts in a short-window returns model motivated by Kim, Wasley, and Wu (2015). We define overall unexpected earnings (UE) as the difference between actual earnings per share and the median analyst EPS forecast as reported in IBES scaled by end of fiscal period stock price. We define unexpected earnings attributable to reclassified remeasurement gains/losses as UE^{GL}. In order to calculate UE^{GL}, we utilize hand-collected management estimates of year-ahead $RECLASS^{GL}$, which are provided in the pension footnote. We define UE^{GL} as $RECLASS^{GL}$ (actual per share) minus $RECLASS^{GL}$ (forecasted per share) scaled by end of fiscal year stock price. UE^{nonGL} is defined as UE - UE^{GL}. All variables, which are defined in Appendix B, are winsorized at the 1% level. Year-fixed effects are included and standard errors are clustered by firm.

$$CAR_{-1,+1} = \alpha + \beta_1 UE^{GL} + \beta_2 UE^{nonGL} + \beta_3 LNMVAL + \beta_4 MB + \varepsilon_t, \quad (4)$$

$CAR_{-1,+1}$ is the three-day cumulative abnormal return surrounding the earnings announcement date. For our short-window returns model, H3 would be supported if reclassified gains/losses provide useful information to market participants, $\beta_1 > 0$.

6. Sample Selection, Descriptive Statistics, and Results

Sample Selection

We begin our sample selection process with all firms reporting on the COMPUSTAT Pension Annual Database. We focus on the post SFAS 158 (ASC 715) time period (2008 to 2015) because prior to SFAS 158 firms were not required to recognize gains/losses and prior service costs in other comprehensive income. Further, by focusing on the post SFAS 158 time period, we reduce the possibility that our results are impacted by a change in accounting standards. Next, we sort the firms based on the ratio of the firm's pension liability to total assets and select the top 200 firms. We drop two firms who utilized mark-to-market pension accounting in our sample. Thus, our initial sample is 198 firms. Our sample selection procedure balances the cost of hand-collecting data with the need for a relatively long time series for each company. After removing firm-year observations with missing variables, we have a total sample population of 1,483 firm years. For the prediction tests, our sample is reduced to 1,292 firm years as lagged data is not available in the initial year following enactment of SFAS 158. See Table 1 Panel A for a sample reconciliation.

Our primary data include financial statement data downloaded from the COMPUSTAT annual database and pension data downloaded from the COMPUSTAT Pension Annual Database. In order to test the usefulness of each reclassified amount, we hand collect $RECLASS^{GL}$ and $RECLASS^{PSC}$ by reading disclosures pursuant to SFAS 158. We also collect the firm's prediction of next year's $RECLASS^{GL}$ when it is available. Following the prior literature, all variables in our regressions, except stock returns, are deflated by number of shares outstanding (Barth et al. 1992; Hann, Heflin, and Subramanayam 2007; Dong et al. 2014). All variables used in our tests are described in Appendix B.

Descriptive Statistics

Table 1 provides descriptive statistics pension expense, its disaggregated components, and other variables used in empirical analysis. These statistics are unscaled in order to evaluate the magnitude of these amounts. The mean values of each component of pension expense are in the tens and hundreds of millions of dollars. Because we hand-collect the data, we are able to separate the reclassified gains/losses ($RECLASS^{GL}$) and prior service costs ($RECLASS^{PSC}$) from the remaining items included in the COMPUSTAT "other periodic pension costs" variable (PPOPCC). To our knowledge, we are the first to conduct a large empirical study of these items. We note that the average reclassified loss in our sample ($71.94 million) is nearly as large in magnitude as average total pension expense ($84.77 million) and thus is a material component of pension expense. Reclassified prior service costs represent a much smaller portion of pension expense ($1.44 million). We also note the average annual cash contributions to pension assets are economically significant ($121.75 million).

Insert Table 1

Table 2 reports average reclassified gains/losses and prior service costs for each year in our sample. It appears reclassified losses are growing larger in recent years with the largest average loss of $113.86 million occurring in 2015. In contrast, reclassified prior service costs are decreasing, indicating that in recent years firms have made fewer amendments to retroactively increase pension benefits.

Insert Table 2

Ohlson's (1999) discussion of value relevance identifies persistence (an item's ability to predict its own future value) as contributing to value relevance. Consistent with this notion, Rees and Shane (2012) identify persistence as a characteristic that could be used to determine which

performance measures are included in net income.[16] Further, Ohlson (1999) argues persistence contributes to value relevance. Thus, before reporting regression results, we first discuss descriptive statistics concerning the persistence of the disaggregated components of pension expense.

In Table 3, we report autocorrelations up to six lags for each of the components of pension expense. Not surprisingly, the service and interest cost components of pension expense exhibit a highly persistent autocorrelation structure. Expected returns on plan assets are also very persistent. This is in contrast to actual returns on plan assets, which are much less persistent. The persistence patterns of expected, and actual returns on plan assets are consistent with the FASB's willingness to use expected returns instead of actual returns to smooth fluctuations in pension expense (reduce volatility) (SFAS 87 para. 179).

Table 3 also shows that $RELCASS^{GL}$, $RELCASS^{PSC}$, and the remaining components of pension expense (other) are each significantly persistent across all lags, although not of the same magnitude as some of the other components of pension expense. This explains why the magnitude of the autocorrelation of total pension expense is less than some of its components. Reclassified gains/losses being less persistent than other components of pension expense is reasonable given that firms' gain/loss may net against each other in any given year before surpassing the corridor to require reclassification. In sum, both reclassified components of pension expense are statistically, positively persistent up to six lags. This is contrary to the expectations of standard setters and commentators that over time gains and losses would rarely be reclassified (SFAS 87, paragraph 184).

Insert Table 3

[16] Rees and Shane (2012) review other studies that identify persistence as a characteristic that could be used to determine which revenues, expenses, gains and losses should be included in net income.

Table 4 contains the correlation matrix of the variables used in empirical tests. We note predictable correlations between stock price and book value and income statement variables. We also note positive correlations between reclassification amounts and their respective OCI and AOCI amounts.

Insert Table 4

Results

Predictive Value

Standard setters have stated that financial statements, among other things, provide information that has predictive value. In Table 5 we examine H1 by estimating equation 1. Column (1) contains only pension expense variables. Column (2) includes pension expense and pension-related OCI amounts. Finally, column (3) contains all pension-related book value and comprehensive income amounts. Across all three columns, we find $RECLASS^{GL}$ and $RECLASS^{PSC}$ are useful in predicting future pension expense as evidenced by a positive and significant association with year-ahead pension expense. Results are contrary to expectations of standard setters and commentators that reclassification adjustments would seldom be necessary, thus it is somewhat surprising they demonstrate predictive ability over a long time series. Interestingly, the current period gains/losses (OCI^{GL}) are also predictive of pension expense. Further, the cumulative gain/loss remaining in AOCI, $AOCI^{GL}$, also demonstrates a positive association with pension expense. This appears reasonable given that future reclassified amounts, which will impact net income, are determined from the cumulative gains/losses in AOCI from prior periods.

Insert Table 5

In Table 6 we provide evidence for our empirical test of H2. Column (1) contains only pension expense variables. Column (2) includes pension expense and pension-related OCI amounts. Finally, column (3) contains all pension-related book value and comprehensive income amounts. Table 6 indicates that lagged cash contributions are predictive of future cash contributions. In columns 1 and 2 of Table 6, we find support for $RECLASS^{GL}$ being a useful predictor of cash contributions. Column 2 also indicates that OCI^{GL} also has predictive power for year-ahead cash contributions. When we include pension-related AOCI amounts in column (3), we find evidence of $AOCI^{GL}$ being a useful predictor of year-ahead pension expense. Interestingly, the coefficient estimates for $RECLASS^{GL}$ and OCI^{GL} become insignificant. This is potentially due to collinearity between $AOCI^{GL}$, $RECLASS^{GL}$, and OCI^{GL}.[17]

Results demonstrate the gains/losses that have accumulated over time are informative of the firm's future need to commit less (more) firm resources to fund the pension plan. This is informative given Ballester et al.'s (1998) assertion that analysts need to predict a firm's cash contributions to pension funds as inputs to cash flow valuation models and to assess cash flow requirements. It is also consistent with survey evidence from Drake, Hales, and Rees (2017) that professionals find OCI very important in identifying red flags when assessing future cash flows.

We find no predictive power of $AOCI^{PSC}$, $RECLASS^{PSC}$, or OCI^{PSC} in predicting year-ahead cash contributions. In untabulated analyses we replace lagged cash contributions with managements' prediction of the year-ahead cash contributions. Interestingly, results remain qualitatively similar suggesting that $AOCI^{GL}$, $RECLASS^{GL}$, and OCI^{GL} have incremental explanatory power for future cash flows, even after controlling for management expectations.[18]

[17] An alternative research design when testing future cash contributions would be to control for the firm's net funded pension position directly instead of the cumulative gains/losses in AOCI. Results are robust to this research design.

[18] We examine whether our cash contribution prediction results hold after dropping years affected by the Moving Ahead for Progress in the 21st Century Act (MAP-21), a funding bill signed into law on July 6th, 2012 that provided

Insert Table 6

Pricing Implications

In Table 7 we examine H3. Table 7 Panel A presents the results of estimating equation (3). Column (1) contains only income statement variables. Column (2) includes income statement and OCI amounts. Finally, column (3) contains book value and comprehensive income amounts. All three columns of Panel A indicate pricing implications for $RECLASS^{GL}$ but not $RECLASS^{PSC}$. More specifically, $RECLASS^{GL}$ demonstrates a positive and significant association with MV after controlling for components of comprehensive income and book value amounts. In column (3), we also find evidence that the current period pension gains/losses are informative to investors as OCI^{GL} is also positive and significant. Further, we find that the coefficient estimate for $RECLASS^{GL}$ is significantly greater than the coefficient estimate for OCI^{GL}.

We perform a dominance analysis to determine the relative importance of each of the independent variables based on the contribution of each to the overall model fit statistic (Grömping 2007; Budescu 1993). Not surprisingly, NIX and BVX^{OTHER} demonstrate the strongest relative performance in explaining market value, followed by the net financing (FIN) and compensation costs (COMP). Interestingly, $RECLASS^{GL}$ is the next highest ranked variable, exhibiting stronger relative importance than OCI^{GL} and $AOCI^{GL}$, which fails to demonstrate a statistical association with MV. Results are consistent with investors assigning greater weight to reclassified gains/losses than to current period gains/losses. This finding is consistent with results reported in Dong et al. (2014), who document that the market assigns greater weight to realized gains/losses on AFS securities relative to unrealized gain/loss on AFS securities. In summary, results appear consistent

pension funding relief for firms sponsoring defined-benefit pension plans. After dropping the years affected by this bill, our cash contribution results remain qualitatively similar. Due to data limitations (small number of observations) in the post-MAP-21 period, we do not estimate our cash contribution model in the post-MAP-21 period.

with investors finding the current period gains/losses informative, however, they place greater emphasis on the subsequent reclassification to earnings. Results are robust to multicollinearity concerns as the variance inflation factor (VIF) is 2.22, well below the recommended threshold of 10.

Table 7 Panel B presents results from estimating equation (4). As described above, we evaluate the market's reaction to the difference between the firm's expected reclassified amount and that actual amount. Table 7 Panel B provides evidence of a positive and significant ERC for the portion of unexpected earnings attributable to unexpected reclassified gain/loss, UE^{GL}. Further, the magnitude of the coefficient estimate is more positive for UE^{GL} relative to unexpected earnings not related to reclassification adjustments, UE^{nonGL}. Thus, we find no evidence that reclassified gains/losses are less informative than other components of earnings.

Insert Table 7

In summary of results for H3, we find that investors value reclassified gains/losses ($RECLASS^{GL}$) as evidenced by positive associations with stock price and short-window returns. We also find some mixed evidence that current period gains/losses (OCI^{GL}) are also associated with stock price. However, we fail to note any association between cumulative gains/losses ($AOCI^{GL}$) and stock price.

7. Conclusion

Our paper investigates the predictive usefulness and value relevance of pension-related remeasurement gains/losses and increases/decreases in prior service cost recognized in OCI, closed to AOCI, and reclassified to earnings. Scholars who advocate clean surplus accounting argue all items recognized in OCI and closed to AOCI should be reclassified to earnings. Opponents argue against reclassification because of the time lag between when the economic event

occurs and when it affects net income. Unlike the AFS-related reclassifications triggered by the occurrence of a market transaction or the arrival of new information (Dong et al. 2014 and Badertscher et al. 2014, respectively), the pension-related adjustments we study are mechanical. Gains/losses are reclassified only if a materiality threshold is passed, and prior service costs are reclassified over the life of employees benefiting from the plan amendment.

We use hand-collected data to assess the persistence and usefulness of pension-related reclassification adjustments for predicting future pension expense and cash contributions after controlling for pension-related OCI and AOCI. We find that both are highly persistent. The persistence of gain/loss adjustments contradicts the claims of advocates of deferral and reclassification that over-time gains/ losses would offset each other so that the materiality threshold for reclassification seldom would be triggered. The persistence of reclassification gains/losses helps to explain why they are useful in predicting pension expense and, in turn, net income.

The link between pension-related reclassification adjustments, OCI, AOCI and cash contributions is less direct. U.S. GAAP provides guidance for computing these amounts. Minimum funding requirements are provided by the IRS. The two sets of guidance were developed for different purposes, and therefore allow the use of different assumptions and computational techniques, with IRS requirements changing whenever legislative agendas change. Minimum cash contributions are based on liabilities accrued during the year and the "funding shortfall" (i.e., excess of plan liabilities over plan asset), which currently must be amortized over seven years. In contrast, U.S. GAAP requires amortization only of the amount beyond the materiality threshold and over a longer period (i.e. the average remaining service lives of plan participants). Results indicate the cumulative gain/loss in AOCI is useful in predicting cash contributions.

As discussed earlier, arguments can be made for expecting (not expecting) pension-related adjustments, OCI, and AOCI to be value relevant. We find that gain/loss reclassifications and OCI both are priced, with the coefficient of the reclassification adjustment being significantly larger. Finding that the market weights amounts recognized in earnings more heavily than amounts recognized in OCI may be contrary to the expectations of proponents of eliminating reclassification. Further evidence of the pricing implications of gain/loss reclassifications is provided by short-window returns tests, which show that unexpected reclassification gains/losses have incremental explanatory power.

Importantly, our research informs regulators and standard setters regarding the appropriateness of items reclassified from AOCI to income. Our findings suggest that reclassifications of prior service costs and remeasurement gains/losses are substantively different. While prior service cost reclassifications are persistent and useful for predicting year-ahead pension expense, they are not useful in predicting future contributions and are not priced by the market. It may be that, as argued by critics of current practice, prior service cost is not useful because it is a stale and garbled measure. Alternatively, it may be because during the last ten years there have been few amendments increasing benefits for service already performed. Accordingly, as Table 2 shows the magnitude of prior service cost reclassifications has decreased steadily, and the amendments that have incurred in recent years have resulted in prior service cost credits rather than prior service cost debits.

To the extent that persistence, predictive ability and value relevance indicate that amounts generated by application of an accounting method are decision useful, our results provide some support for continuing to defer and reclassify remeasurement gains/losses. The nagging question that remains and has yet to be resolved empirically is whether an accounting method that results

in decision-useful information should be continued when the economic meaning of the resulting measures is ambiguous. We continue to explore potential pricing implications of RECLASS^{GL}, AOCI^{GL}, and OCI^{GL}.

Appendix A

The paragraphs and equations that follow explain the disaggregation of comprehensive income and the balance sheet to identify the amounts used in empirical analysis.

Net income (NI) during a period equals net income before reclassified amounts (NIBR) plus the reclassified amounts, where $RECLASS^{GL}$ is positive (negative) for reclassified gains (losses) and $RECLASS^{PSC}$ is positive (negative) for decreases (increases) in reclassified prior service costs.

$$NI_t = NIBR_t + RECLASS^{GL}_t + RECLASS^{PSC}_t \quad (1A)$$

The change in retained earnings (RE) during a period equals NI minus dividends (DIV), which we decompose as NIBR plus $RECLASS^{GL}$ plus $RECLASS^{PSC}$ minus DIV.

$$\Delta RE_t = NI_t - DIV_t = NIBR_t + RECLASS^{GL}_t + RECLASS^{PSC}_t - DIV_t \quad (2A)$$

Hence RE increases with reclassified gains and decreases with reclassified losses. Additionally, RE increases with reclassified decreases to prior service cost and decreases with reclassified increases to prior service cost.

The change in unrealized gain (loss) ($\Delta AOCI^{GL}$) equals the total (i.e., unrealized plus realized) gain or loss ($Total^{GL}$) minus $RECLASS^{GL}$ during the period.

$$\Delta AOCI^{GL}_t = Total^{GL}_t - RECLASS^{GL}_t \quad (3A)$$

Hence, $AOCI^{GL}$ decreases with reclassified gains, and increases with reclassified losses.

The change in unrealized prior service cost ($\Delta AOCI^{PSC}$) equals the total (i.e., unrealized plus realized) change in prior service cost ($Total^{PSC}$) minus $RECLASS^{PSC}$ during the period.

$$\Delta AOCI^{PSC}_t = Total^{PSC}_t - RECLASS^{PSC}_t \quad (4A)$$

Hence, $AOCI^{PSC}$ decreases with reclassified decreases to prior service cost, and increases with reclassified increases to prior service cost.

The change in owners' equity (OE) equals ΔRE plus the change in accumulated other comprehensive income (ΔAOCI) plus the change in contributed capital (ΔCC) during the period. ΔRE is given in equation (2) and ΔAOCI equals $\Delta AOCI^{GL}$ plus $\Delta AOCI^{PSC}$ plus other comprehensive income from sources other than gain (loss) and changes in prior service cost (OCI^{Other}) during the period, yielding:

$$\Delta OE_t = \Delta RE_t + \Delta AOCI_t + \Delta CC_t$$

$$= (NIBR_t + RECLASS^{GL}_t + RECLASS^{PSC}_t - DIV_t) + (Total^{GL}_t - RECLASS^{GL}_t) +$$

$$(Total^{PSC}_t - RECLASS^{PSC}_t) + OCI_t^{Other} + \Delta CC_t$$

$$= NIBR_t + Total^{GL}_t + Total^{PSC}_t - DIV_t + OCI_t^{Other} + \Delta CC_t \quad (5A)$$

Hence, ΔOE is unaffected by $RECLASS^{GL}$ and $RECLASS^{PSC}$.

Market Value Model

Our market value model is an expanded version of the frequently estimated regression of market value of equity on book value of equity (BV) and comprehensive income, denoted (CI):

$$MV_t = \alpha + \beta_1 BV_t + \beta_2 CI_t + \varepsilon_t \quad (6A)$$

We decompose both BV and CI into components, consistent with but somewhat more detailed than in equations (1) through (5). In order to stay consistent with equations (1) through (5), all variables in our research design are signed so that positive (negative) amounts correspond to increases (decreases) in BV and CI. Therefore, we expect all relevant explanatory variables to be positively associated with market value.

First, we decompose BV into the after-tax book value of gain (loss) ($AOCI^{GL}$) plus the after-tax book value of prior service cost ($AOCI^{PSC}$) plus the after-tax book value of other net assets (BV^{Other}).

$$BV_t = BV_t^{Other} + AOCI^{GL}_t + AOCI^{PSC}_t \quad (7A)$$

Next, we decompose comprehensive income (CI) into net income (NI) and other comprehensive income (OCI).

$$CI_t = NI_t + OCI_t \tag{8A}$$

We further decompose NI into net income before pension expense (NIX) and pension expense (PEXP).

$$NI_t = NIX_t + PEXP_t \tag{9A}$$

We then disaggregate pension expense into service cost (COMP), net financing costs (FIN)[19], reclassified gain (loss) ($RECLASS^{GL}$), reclassified prior service costs ($RECLASS^{PSC}$), and the remaining pension expense components attributable to things such as settlements and curtailments (OTHER). That is,

$$PEXP_t = COMP_t + FIN_t + RECLASS^{GL}_t + RECLASS^{PSC}_t + Other_t \tag{10A}$$

We decompose OCI into OCI^{ACT} plus OCI^{PSC} plus other comprehensive income from sources other than gain (loss) and changes in prior service cost (OCI^{Other}).

$$OCI_t = OCI^{GL}_t + OCI^{PSC}_t + OCI_t^{Other} \tag{11A}$$

Incorporating these variable decompositions into equation (6) yields the market value model:

$$MV_t = \alpha + \beta_1 BV_t^{Other} + \beta_2 AOCI^{ACT}_t + \beta_3 AOCI^{PSC}_t + \beta_4 NIX_t + \beta_5 COMP_t + \beta_6 FIN_t + \beta_7 RECLASS^{GL}_t + \beta_8 RECLASS^{PSC}_t + \beta_9 Other_t + \beta_{10} OCI^{GL}_t + \beta_{11} OCI^{PSC}_t + \beta_{12} OCI_t^{Other} + \varepsilon_t \tag{12A}$$

[19] FASB (2016) describes net financing costs as the sum of interest cost and expected return on plan assets.

Appendix B – Variable Descriptions

Variable	Description
MV	Market value of equity
BV^{Other}	Book value purged of the effect of non-recycled actuarial gains/losses and prior service costs, scaled by common shares outstanding
$AOCI^{GL}$	The portion of AOCI attributable to non-recycled actuarial gains/losses, scaled by common shares outstanding
$AOCI^{PSC}$	The portion of AOCI attributable to non-recycled prior service cost, scaled by common shares outstanding
NIX	Net Income purged of the effect of pension expense, scaled by common shares outstanding
COMP	Service cost component of pension expense, scaled by common shares outstanding
INT	Interest cost component of pension expense, scaled by common shares outstanding
ERPLNA	Expected return on plan assets component of pension expense, scaled by common shares outstanding
ARPLNA	Actual return on plan asset component of pension expense, scaled by common shares outstanding
FIN	Expected return on plan assets less interest cost components of pension expense, scaled by common shares outstanding
$RECLASS^{GL}$	Recycled actuarial gain/loss component of pension expense, scaled by common shares outstanding
$RECLASS^{PSC}$	Recycled prior service cost component of pension expense, scaled by common shares outstanding
OTHER	Remaining components of pension expense, scaled by common shares outstanding
OCI^{GL}	The portion of other comprehensive income attributable to unrealized gains/losses that arose during the period, scaled by common shares outstanding
OCI^{PSC}	The portion of other comprehensive income attributable to unrealized prior service cost that arose during the period, scaled by common shares outstanding
OCI^{OTHER}	The remaining portion of other comprehensive income, scaled by common shares outstanding
$CAR_{-1,+1}$	Cumulative market-adjusted abnormal return over the three days centered on the firm's annual earnings announcement.
UE^{nonGL}	A firm's unexpected earnings measured as (actual EPS - unexpected amortized actuarial gains/losses per share - median analyst EPS forecast as reported in IBES)/End of Fiscal Period Stock Price
UE^{GL}	A firm's unexpected amortized actuarial gains/losses per share. Calculated as (actual recycled actuarial gain/loss per share - forecasted amortized gains/losses per share)/End of fiscal period stock price
LNMVAL	The natural logarithm of a firm's market value of equity
MB	The ratio of a firm's market value of equity to its book value of equity
CC	Employer cash contribution to pension plan assets
EXPECT CC	Firm's prediction of the following year's cash contribution made at the end of the current year
PEXP	Pension expense
PPX	Pension expense purged of the effect of $RECLASS_{GL}$ and $RECLASS_{PSC}$

Figure 1
Financial Statement Effects of Applying the Mixed Attributes Model of U.S. GAAP

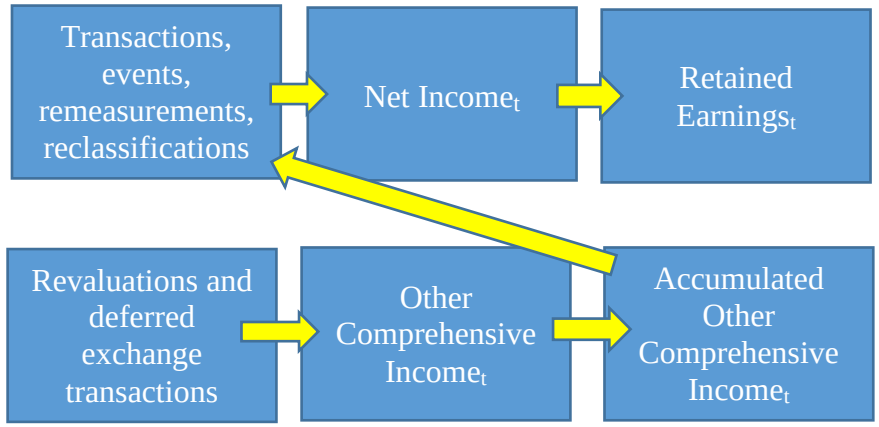
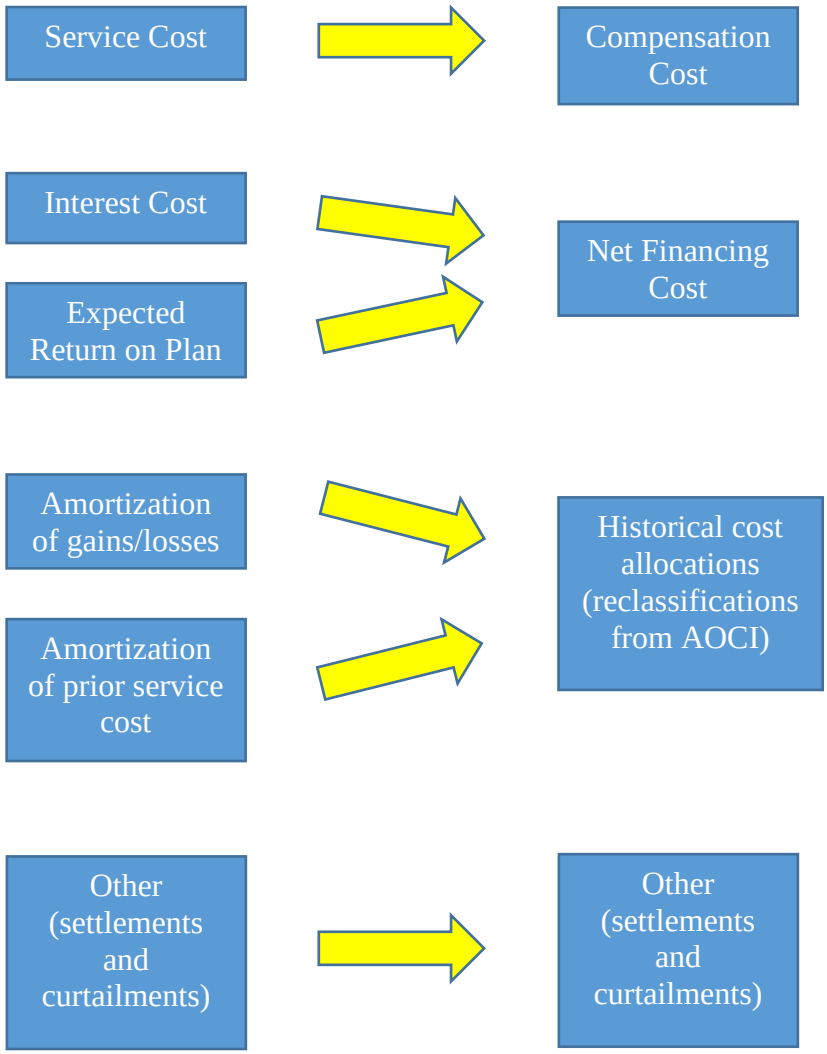


Figure 2
Results of Applying a Mixed Attributes Model for Computing Net Periodic Pension Cost



Note: The FASB's Accounting Standards Update No 2017-07 (FASB 2017) requires the service cost component of net periodic pension cost to be reported "in the same line item or items as other compensation costs arising from services rendered by the pertinent employees during the period." The remaining components are to be reported below the subtotal of income from operations (715-20-45-3A). Further, FASB (2017) permits reporting the interest cost and expected return on plan assets separately or together as net financing cost (715-20-55-13).

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TABLE 1 - Sample Description

Panel A: Sample Selection

	Observations
Beginning Sample	1782
Missing $RECLASS^{GL}$ or $RECLASS^{PSC}$	(53)
Missing $AOCI^{GL}$ or $AOCI^{PSC}$	(187)
Missing OCI^{GL} or OCI^{PSC}	(59)
Value Relevance Sample	1483
Missing lagged $RECLASS^{GL}$ or $RECLASS^{PSC}$	(3)
Missing lagged OCI^{GL} or OCI^{PSC}	(178)
Missing cash contribution data	(10)
Prediction Sample	1292

Table 1 - Sample Description

Panel B: Descriptive Statistics

Variable	N	Mean	Median	p25	p75
MV	1,483	8,837.83	2,361.09	648.86	7,239.78
BVX	1,483	3,526.67	1,079.90	312.34	3,190.52
$AOCI^{GL}$	1,483	(850.02)	(166.75)	(674.64)	(40.53)
$AOCI^{PSC}$	1,483	(3.09)	(0.20)	(3.90)	0.04
NI	1,483	512.32	117.15	10.33	417.30
PEXP	1,483	(84.77)	(15.18)	(65.90)	(2.99)
SVC	1,483	(60.86)	(10.60)	(40.26)	(2.48)
INT	1,483	(191.39)	(40.62)	(165.00)	(12.38)
ERPLNA	1,483	245.53	52.48	14.80	199.40
ARPLNA	1,477	178.38	32.50	1.00	168.02
PPOPCC	1,483	(81.32)	(13.62)	(59.00)	(3.33)
$RECLASS^{GL}$	1,483	(71.94)	(11.02)	(46.90)	(2.63)
$RECLASS^{PSC}$	1,483	(1.44)	(0.06)	(1.20)	0.00
OTHER	1,483	(7.43)	(0.00)	(2.20)	0.00
OCI	1,483	(110.01)	(6.21)	(105.03)	27.00
OCI^{GL}	1,483	(109.90)	(10.73)	(82.49)	5.55
OCI^{PSC}	1,483	(0.35)	0.00	(0.42)	0.07
OCI^{OTHER}	1,483	(0.00)	0.04	(0.40)	0.44
CASH CONTRIBUTIONS	1,473	121.75	24.90	5.21	107.09

Table 1 provides the sample composition and descriptive statistics. All variables are signed so that positive (negative) amounts correspond to increases (decreases) in book value and comprehensive income. All variables are unscaled (provided in millions). See Appendix B for variable descriptions.

TABLE 2 - Annual Statistics for RECLASS^{GL} and RECLASS^{PSC}

Panel A: RECLASS^{GL}

Year	N	Mean	Median	p25	p75	Std Dev
2007	138	(47.56)	(6.38)	(31.20)	(1.11)	129.92
2008	168	(25.36)	(3.05)	(16.60)	(0.47)	83.39
2009	169	(42.00)	(8.10)	(25.96)	(1.60)	112.40
2010	171	(59.88)	(9.20)	(47.00)	(3.00)	142.24
2011	173	(73.84)	(12.30)	(55.00)	(3.92)	176.90
2012	175	(95.87)	(17.00)	(70.16)	(5.36)	209.00
2013	173	(109.57)	(19.90)	(75.00)	(6.30)	233.94
2014	171	(79.03)	(12.00)	(48.00)	(2.89)	188.81
2015	145	(113.86)	(19.41)	(68.00)	(6.29)	242.29
Total	1,483	(71.88)	(11.93)	(48.55)	(3.44)	168.77

Panel B: RECLASS^{PSC}

Year	N	Mean	Median	p25	p75	Std Dev
2007	138	(3.06)	(0.55)	(3.00)	0.00	15.92
2008	168	(2.58)	(0.40)	(2.00)	0.00	14.53
2009	169	(2.55)	(0.30)	(1.64)	0.00	13.82
2010	171	(2.19)	(0.10)	(1.11)	0.00	12.79
2011	173	(2.03)	(0.08)	(1.04)	0.00	12.66
2012	175	(1.36)	(0.02)	(1.00)	0.00	13.15
2013	173	(0.38)	(0.00)	(1.00)	0.00	14.74
2014	171	0.13	0.00	(0.70)	0.01	13.20
2015	145	1.10	0.00	(0.40)	0.10	14.18
Total	1,483	(1.44)	(0.16)	(1.32)	0.01	13.89

Notes: Panel A and Panel B provide descriptive statistics for RECLASS^{GL} and RECLASS^{PSC}, respectively, for each year in our sample. RECLASS^{GL} is positive (negative) for reclassified gains (losses). RECLASS^{PSC} is positive (negative) for reclassified decreases (increases) to prior service cost. All variables are in millions.

TABLE 3 - Persistence of Net Income, Pension Expense, and Disaggregated Pension Components

Lag	Net Income	Pension Expense	Service Cost	Interest Cost	Expected Return on Plan Assets	Actual Return on Plan Assets	$RECLASS^{GL}$	$RECLASS^{PSC}$	OCI^{GL}	OCI^{PSC}
1	0.8224*	0.8637*	0.9898*	0.9958*	0.9971*	0.3180*	0.9554*	0.8898*	-0.1479*	0.0402
2	0.7679*	0.8138*	0.9763*	0.9926*	0.9939*	0.2177*	0.9169*	0.7899*	0.1381*	-0.0188
3	0.7481*	0.7837*	0.9597*	0.9907*	0.9916*	0.6005*	0.8960*	0.7219*	0.5550*	0.2683*
4	0.7449*	0.7180*	0.9451*	0.9879*	0.9883*	0.3958*	0.8717*	0.6269*	0.3088*	0.0093
5	0.6953*	0.6852*	0.9319*	0.9853*	0.9858*	0.1557*	0.8602*	0.5552*	-0.5151*	-0.1294*
6	0.6244*	0.7197*	0.9154*	0.9834*	0.9823*	0.0365	0.8703*	0.4705*	0.8216*	0.0616

Notes: The table reports the autocorrelation structure of Net Income, Pension Expense and the disaggregated components of pension expense. All variables are unscaled (as defined in Table 1). * represents statistical significance at the 1% level.

Table 4 - Correlation Table

		(1)	(2)	(3)	(4)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1)	MV	1.00														
(2)	BVX	**0.64**	1.00													
(3)	$AOCI^{GL}$	**(0.34)**	**(0.43)**	1.00												
(4)	$AOCI^{PSC}$	**0.07**	0.04	0.00	1.00											
(6)	NIX	**0.72**	**0.58**	**(0.34)**	**0.06**	1.00										
(7)	PEXP	**(0.31)**	**(0.39)**	**0.62**	**0.17**	**(0.31)**	1.00									
(8)	SVC	**(0.58)**	**(0.56)**	**0.53**	**0.20**	**(0.47)**	**0.67**	1.00								
(9)	ERPLNA_INT	**0.55**	**0.55**	**(0.74)**	**(0.12)**	**0.43**	**(0.58)**	**(0.80)**	1.00							
(10)	FIN	**0.58**	**0.49**	**(0.50)**	(0.02)	**0.44**	**(0.33)**	**(0.70)**	**0.87**	1.00						
(11)	$RECLASS^{GL}$	**(0.35)**	**(0.46)**	**0.80**	(0.03)	**(0.37)**	**0.73**	**0.56**	**(0.68)**	**(0.55)**	1.00					
(12)	$RECLASS^{PSC}$	(0.05)	**(0.07)**	**0.07**	**0.83**	(0.05)	**0.28**	**0.34**	**(0.24)**	**(0.13)**	**0.06**	1.00				
(13)	OTHER	**(0.12)**	**(0.06)**	**0.07**	**0.10**	(0.04)	**0.42**	**0.14**	**(0.24)**	**(0.24)**	**0.07**	**0.11**	1.00			
(14)	OCI^{GL}	**(0.07)**	**(0.16)**	**0.43**	(0.01)	**(0.07)**	**0.06**	**0.22**	**(0.29)**	**(0.19)**	**0.12**	0.02	**(0.05)**	1.00		
(15)	OCI^{PSC}	**0.09**	**0.06**	(0.01)	**0.37**	**0.08**	**(0.11)**	**(0.06)**	**0.07**	**0.09**	**(0.08)**	**0.17**	**(0.20)**	0.04	1.00	
(16)	OCI^{OTHER}	0.04	**0.12**	**(0.13)**	**(0.09)**	**0.05**	**(0.25)**	**(0.19)**	**0.15**	**0.09**	**(0.26)**	**(0.14)**	0.03	**0.15**	0.03	1.00
(17)	CC	**(0.27)**	**(0.40)**	**0.59**	**0.07**	**(0.30)**	**0.63**	**0.47**	**(0.52)**	**(0.21)**	**0.55**	**0.15**	**0.12**	**0.17**	(0.04)	**(0.18)**

Table 4 provides univariate correlations for all variables used in our analyses. Variables are defined as in Appendix B. Bolded correlations are significant at the 5% level.

TABLE 5 - Predict Pension Expense

	(1)			(2)			(3)		
$PEXP_{t+1}$	Coef	P-Value		Coef	P-Value		Coef	P-Value	
$AOCI^{GL}$							0.025	0.000	***
$AOCI^{PSC}$							0.089	0.399	
COMP	0.983	0.000	***	0.910	0.000	***	0.877	0.000	***
FIN	0.437	0.000	***	0.484	0.000	***	0.506	0.000	***
$RECLASS^{GL}$	0.799	0.000	***	0.809	0.000	***	0.559	0.000	***
$RECLASS^{PSC}$	1.722	0.000	***	1.605	0.000	***	1.168	0.024	**
OTHER	0.409	0.001	***	0.509	0.000	***	0.432	0.002	***
OCI^{GL}				0.054	0.000	***	0.032	0.005	***
OCI^{PSC}				0.253	0.148		0.101	0.519	
Constant	0.079	0.011		0.029	0.329		0.029	0.310	
Firm-clustered standard errors	Yes			Yes			Yes		
Year fixed effects	Yes			Yes			Yes		
Observations	1,292			1,292			1,292		
Adjusted R-squared	0.654			0.683			0.697		

Notes: The table examines the ability of pension-related amounts to predict year-ahead pension expense. All variables are defined in Appendix B. *, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.

TABLE 6 - Predict Cash Contributions

	1			2			3		
Cash Contributions$_{t+1}$	Coef	P-Value		Coef	P-Value		Coef	P-Value	
Cash Contributions$_t$	0.448	0.000	***	0.424	0.000	***	0.373	0.000	***
AOCI^{GL}							0.063	0.002	***
AOCI^{PSC}							0.114	0.683	
COMP	0.757	0.002	***	0.655	0.007	***	0.628	0.014	**
FIN	0.390	0.000	***	0.490	0.000	***	0.589	0.000	***
RECLASS^{GL}	0.688	0.000	***	0.743	0.000	***	0.199	0.479	
RECLASS^{PSC}	1.291	0.337		1.126	0.371		0.523	0.791	
OTHER	-0.631	0.143		-0.435	0.174		-0.555	0.124	
OCI^{GL}				0.096	0.000	***	0.044	0.139	
OCI^{PSC}				0.394	0.526		0.076	0.891	
Constant							-0.153	0.009	***
Firm-clustered standard errors	Yes			Yes			Yes		
Year fixed effects	Yes			Yes			Yes		
Observations	1,292			1,292			1,292		
Adjusted R-squared	0.464			0.486			0.506		

Notes: The table examines the ability of pension-related amounts to predict year-ahead cash contributions to the firm's pension fund after controlling for current year contributions. All variables are as defined in Appendix B. *, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.

TABLE 7 - Pricing Implications

Panel A: Value Relevance

	(1)			(2)			(3)			
MV	Coef	P-Value		Coef	P-Value		Coef	P-Value		Dominance
BVX^{OTHER}							0.629	0.000	***	2
$AOCI^{GL}$							-0.526	0.468		6
$AOCI^{PSC}$							19.419	0.320		7
NIX	5.528	0.000	***	5.585	0.000	***	4.609	0.000	***	1
COMP	-44.121	0.002	***	-44.165	0.001	***	-34.682	0.005	***	4
FIN	20.135	0.023	**	20.819	0.013	**	19.176	0.017	**	3
$RECLASS^{GL}$	19.481	0.021	**	20.491	0.022	**	29.203	0.000	***	5
$RECLASS^{PSC}$	12.054	0.166		13.396	0.143		2.513	0.683		10
OTHER	-4.756	0.590		-5.767	0.469		-6.437	0.363		8
OCI^{GL}				0.702	0.128		1.524	0.054	*	9
OCI^{PSC}				-4.267	0.831		-14.433	0.366		11
OCI^{OTHER}				1.068	0.235		0.722	0.329		12
Constant	15.069	0.000		13.566	0.000	***	7.945	0.025	**	
Firm-clustered standard errors	Yes			Yes			Yes			
Year fixed effects	Yes			Yes			Yes			
Observations	1,483			1,483			1,483			
Adjusted R-squared	0.651			0.653			0.682			

Panel B: Short-Window Returns

CAR	Coef	P-Value	
UE_GL	4.263	0.001	***
UE_nonGL	0.761	0.002	***
LNMVAL	-0.002	0.237	
MB	0.000	0.218	
Constant	-0.019	0.202	
Observations	869		
Adjusted R-squared	0.066		

Notes: Panel A and B examines the pricing implications of pension-related amounts. All variables are as previously defined. *, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.